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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FINDLEY, CHRISTOPHER G	
ART UNIT	PAPER NUMBER
2482	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,498	LEWIN ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER FINDLEY	2482	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-30* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-30* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/15/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 12, 16, 17, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Nobori et al. (US 7110021 B2, hereinafter referred to as "Nobori").

Re **claim 12**, Nobori discloses a vehicle positioning system comprising a three-dimensional imaging apparatus arranged acquire a plurality of three dimensional images of a target area as the vehicle passes the target area and a processor adapted to process the images from the different positions so as to create the model of the environment in relation to the vehicle and determine how to position the vehicle with respect to the target area (Nobori: Fig. 15 and column 15, lines 25-39).

Re **claim 16**, Nobori discloses that as the vehicle is positioned the processor processes information from the three-dimensional imaging apparatus and updates the model of the environment (Nobori: column 15, lines 51-65).

Re **claim 17**, Nobori discloses a vehicle having a parking system as claimed in claim 12 (Nobori: Fig. 10, the cameras and sensor are mounted on a vehicle).

Re **claim 25**, Nobori discloses a movement control system for a vehicle operable in two modes, a movement mode in which a proximity sensor operates to detect any objects within the path of the vehicle (Nobori: column 12, lines 15-28), and an interaction mode in which a three dimensional ranging apparatus determines range information about a target area to form a model of the target area (Nobori: column 4, line 64-column 5, line 45).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-11, 13-15, 19, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobori et al. (US 7110021 B2) in view of Regensburger et al. (US 20020169537 A1, hereinafter referred to as "Regenburger").

Re **claim 1**, Nobori discloses a movement control system comprising at least one three-dimensional imaging apparatus adapted to image an environment (Nobori: Fig. 9, camera 1 and camera 2) and a processor for analysing the image so at to create a model of the environment (Nobori: Fig. 9, position computation 14, image variable sysnthesis 15, image fixed-synthesis 16, and synthesis scheme selection 17B and 17C act to synthesize the environment in a three-dimensional space).

Nobori also discloses a companion obstacle sensor (Nobori: Fig. 9, obstacle sensor 31) to be used in conjunction with the cameras, but Nobori does not specifically disclose that the three-dimensional imaging apparatus comprises an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a spot processor adapted to determine, from the detected location of a spot in the scene, the range to that spot; and generating a movement control signal based on the created model. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 2**, Nobori discloses a movement control system as claimed in claim 1 adapted to be applied to a vehicle (Nobori: Fig. 10, the cameras and sensor are mounted on a vehicle).

Re **claim 3**, Nobori discloses that the at least one three-dimensional imaging apparatus is adapted to acquire three dimensional images of the environment at a plurality of different positions and the processor is adapted to process images from the different positions so as to create the model of the environment (Nobori: column 4, line 64-column 5, line 2).

Re **claim 4**, Nobori discloses that the three dimensional imaging apparatus has at least two detectors each detector acquiring an image of the scene from a different position (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Re **claim 5**, Nobori discloses a plurality of three dimensional imaging apparatuses arranged at different locations on the vehicle to provide images acquired at different positions (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Re **claim 6**, Nobori discloses that the processor is adapted to merge the data from the images acquired at different positions (Nobori: column 5, lines 3-7).

Re **claim 7**, Nobori discloses that the processor is also adapted to apply stereo image processing techniques to images from different positions in creating the model of the environment (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Re **claim 8**, Nobori discloses that the processor is adapted to use stereo processing techniques to perform edge/corner detection (Nobori: column 5, lines 12-18, "pixels on the boundary of an object and the like are more likely to be selected").

Re **claim 9**, Nobori discloses that the system further comprises a means of determining the relative location of the three-dimensional imaging apparatus as each image is acquired and the processor is adapted to use the information about relative location in creating the model (Nobori: column 5, lines 39-45).

Re **claim 10**, Nobori discloses that the means of determining the relative location of the three dimensional imaging apparatus comprises at least one position sensor (Nobori: column 12, lines 33-38).

Re **claim 11**, Nobori discloses that the means of determining the relative location of the three dimensional imaging apparatus is the processor which is adapted to identify reference objects in the images from each viewpoint (Nobori: column 5, lines 19-28).

Re **claim 13**, Nobori does not specifically disclose that the system is a parking system, the target area is a parking area and the positioning system determines how to park the vehicle in the parking area. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 14**, Nobori does not specifically disclose a user interface and wherein the processor generates a control signal which gives vehicle control instructions via the interface. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 15**, Nobori does not specifically a drive unit for controlling vehicle movement and the processor controls the drive unit so as to position to vehicle. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 19**, Nobori discloses that at least one 3D imager is adapted to image a vehicle blind spot and the movement control signal is a warning that an object has entered the vehicle blind spot (Nobori: column 1, lines 16-27, use of cameras to monitor a blind spot are well known in the art).

Re **claim 26**, Nobori discloses a companion obstacle sensor (Nobori: Fig. 9, obstacle sensor 31) to be used in conjunction with the cameras, but Nobori does not specifically disclose that, in movement mode, the three dimensional ranging apparatus operates as the proximity sensor. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 27**, Nobori does not specifically disclose that the three-dimensional imaging apparatus comprises an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a spot processor adapted to determine, from the detected location of a spot in the scene, the range to that spot. However, Regensburger discloses an apparatus for three-dimensional perception of an environment, wherein light beams are projected from a vehicle for determining position of the vehicle and monitoring separation from other parked vehicles and the vehicle may be parked autonomously (Regensburger: paragraph [0030]), thereby indicating that the sensor input is used for controlling movement of the vehicle.

Since both Nobori and Regensburger relate to the use of sensors to monitor the surroundings of a vehicle, one of ordinary skill in the art at the time of the invention would have found it obvious to incorporate the light beam sensing scheme of Regensburger in the obstacle sensor of Nobori in order to provide a system capable of improved distance analysis in three-dimensional scenarios (Regensburger: paragraph [0003]).

Re **claim 28**, Nobori discloses that the three dimensional imaging apparatus comprises at least two detectors, each detector having a different viewpoint (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Re **claim 29**, Nobori discloses at least two three dimensional imaging apparatuses each having a different viewpoint (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Re **claim 30**, Nobori discloses that the processor applies stereo imaging techniques to the images acquired from different viewpoints (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

5. Claims 18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobori et al. (US 7110021 B2) in view of McMorran et al. (US 5142658 A, hereinafter referred to as "McMorran").

Re **claim 18**, Nobori discloses a vehicle surroundings monitoring device and image production method/program, wherein binocular stereo imaging is performed on data from two or more cameras to determine positioning information with respect to objects outside the vehicle (Nobori: column 4, line 64-column 5, line 45).

Nobori does not specifically disclose that the system is used to dock the vehicle into a moveable platform. However, McMorran discloses a container chassis positioning system, wherein multiple video cameras are used for positioning a truck along a loading/unloading lane to facilitate stopping at an exact point (McMorran: column 2, lines 5-20).

Since both Nobori and McMorran relate to using video cameras to identify the position of a vehicle with repect to outside points, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the loading/unloading zone positioning abilities of McMorran with the system of Nobori in order to provide more efficient loading and unloading of cargo trucks.

Re **claim 20**, Nobori discloses a vehicle surroundings monitoring device and image production method/program, wherein binocular stereo imaging is performed on data from two or more cameras to determine positioning information with respect to objects outside the vehicle (Nobori: column 4, line 64-column 5, line 45).

Nobori does not specifically disclose a robotic arm control unit to a drive means of the robotic arm to either engage an object or accurately place an object. However, McMorran discloses a container chassis positioning system, wherein multiple video cameras are used for positioning a truck along a loading/unloading lane to facilitate stopping at an exact point underneath a crane (McMorran: column 1, line 57-column 2, line 4), wherein computer logic mechanism transfers appropriate signals to the crane controls in crane control room in response to the truck position (McMorran: column 5, lines 12-20).

Since both Nobori and McMorran relate to using video cameras to identify the position of a vehicle with repect to outside points, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the loading/unloading zone positioning abilities of McMorran with the system of Nobori in order to provide more efficient loading and unloading of cargo trucks.

Re **claim 21**, Nobori does not specifically disclose that the processor moves at least part of the arm to scan the three dimensional imaging apparatus relative to the environment to acquire images from a plurality of different positions. However, McMorran discloses that the hoist mechanism may be adjusted and that a camera is mounted on the beam of the crane (McMorran: column 3, lines 35-61).

Since both Nobori and McMorran relate to using video cameras to identify the position of a vehicle with repect to outside points, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the loading/unloading zone positioning abilities of McMorran with the system of Nobori in order to provide more efficient loading and unloading of cargo trucks.

Re **claim 22**, Nobori does not specifically disclose that the three-dimensional imaging apparatus comprises an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a spot processor adapted to

determine, from the detected location of a spot in the scene, the range to that spot. However, McMorran discloses that the system is responsive to fiducial marks (McMorran: column 6, lines 49-62).

Since both Nobori and McMorran relate to using video cameras to identify the position of a vehicle with repect to outside points, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the loading/unloading zone positioning abilities of McMorran with the system of Nobori in order to provide more efficient loading and unloading of cargo trucks.

Re **claim 23**, Nobori discloses that the three dimensional imaging apparatus comprises at least two detectors, each detector acquiring an image of the scene from a different position (Nobori: column 4, line 64-column 5, line 45).

Re **claim 24**, Nobori discloses that the processor applies stereo image processing techniques to the images acquired from different position (Nobori: column 4, line 64-column 5, line 2, binocular stereo imaging).

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is (571)270-1199. The examiner can normally be reached on Monday-Friday (8:30 AM-5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Kelley can be reached on 571-272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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